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ABSTRACT

Community leaders and government agency representatives need to understand local population trends, particularly in situations of rapid change. This publication outlines a simple framework for analysis of population changes, along with useful methods and criteria that can be applied when considering management and policy alternatives. Two population communities must be considered: longterm residents and newcomers. Knowing more about who newcomers are and what types of families they may bring can suggest systematic ways of providing for their arrival, for example, in deciding how to allocate funds for family planning education, health care, school buildings, or job training programs. Analysis of community population trends requires information about the structural characteristics of a population and about population processes, or the way a population changes over time. Structural characteristics include population size, location, age, sex, cultural background, educational levels, and family type. Population processes include fertility, mortality, and migration. Agency representatives and local leaders can use population information to make informed estimates about the social and economic effects of development. Sources of information for population data are listed and described. (KS)

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ED 364 394

POPULATION CHANGE

KNOW THE TRENDS IN YOUR COMMUNITY

Population is one of the most visible signs of change. The distribution, size, and composition of the population shift, as well as the speed with which the movement occurs, have a major effect on the social, cultural, political, fiscal, and environmental aspects of a community, placing demands on local government policymakers and planners.

COPING WITH CHANGE

RC 019416

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Coping With Growth

This publication was part of the Coping with Growth series produced by the Western Rural Development Center in 1979-80. The publications in that series have been reviewed, the information brought up to date, and the series name changed to indicate the relevance of these materials to circumstances other than growth. Other titles from the original series that have been revised include:

WREP 16	*Evaluating Fiscal Impact Studies*
WREP 17	*Minimizing Public Costs of Residential Growth*
WREP 20	*Coping with Rapid Growth: A Community Perspective*
WREP 21	*Citizen Involvement Strategies*
WREP 22	*Interagency Coordination*
WREP 23	*The Public Policy Process*
WREP 29	*Assessing Fiscal Impact*
WREP 30	*Programming Capital Improvements*
WREP 31	*What does the Impact Statement Say about Economic Impacts?*

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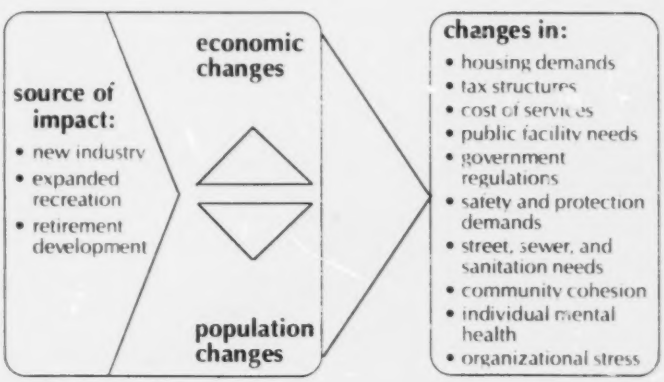
A recreational development, for example, may attract workers from surrounding areas. Not only could this increase school enrollment, it could accelerate the demand for housing, public facilities, and services. Newcomers almost always press for improved services such as police and fire protection, medical care, garbage pick-up, snow removal, improved roads, larger schools. More people may generate added community income; however, they may also require special services, expanded business inventories, and improved management capacities. New policies may be needed to regulate the way growth occurs.

Community leaders and decision makers can anticipate a good many of these changes and related public needs and demands through an understanding of population trends. While population information will not solve the problems of rapid change, it can help to clarify the facts about present and future community residents. With this information, community leaders should find they are better prepared to meet demands for facilities and services before crises occur.

A little population information can tell a lot about a community. With minimum guidance, a citizens' committee, a work-study student, or an office clerk can assemble enough facts to explain the age structure of the local population and how it might be affected by an influx of young families. Knowing more about who newcomers are, and what types of families they may bring, can suggest systematic ways of providing for their arrival, for example, in deciding how to allocate funds for family planning education, health care, school buildings, or job training programs. Officials can build community understanding by involving the general public in the collection, organization, and analysis of population information, assuring more knowledgeable public support for future improvements.



Both private citizens and government representatives need to be in a position to make informed estimates about population trends in order to guide responsible public choice, including realistic policy priorities, and evaluation of the possible effects of development. Economic change and population change are inseparable. They interact to affect virtually everything underlying community well-being—adequate housing, stable businesses, secure jobs, serviceable streets, quality schools, dependable hospitals, adequate protection, responsive government planning and decision making systems.

The chart illustrates the interdependence of these relationships. Anticipation and management of these secondary impacts depends to a great extent on the ability of community leaders to assess and interpret changing population size, distribution, composition, and processes. A reasonably accurate assessment will go a long way in assuring fair and equitable decisions that are sensitive to the needs of all affected people.

ANALYZING POPULATION CHANGE

There are two "population communities" that must be understood: the local setting and the source of impact.[1]

The local setting is the community or long-term, resident population being affected by the new development. The source of impact is the new project or disturbance being introduced into the community—for example, an influx of newcomers who may be commuters, retirees, construction workers, or a combination of these. Until these two groups are fully integrated, they can be viewed as having different social systems, each composed of a variety of people with different values, expectations, concerns, and patterns of life.

Differences in the "local setting" and the "source of impact" communities are likely to be much more evident in small, rural towns. Whereas they may be masked by the large size of metropolitan areas, smaller communities may need to explicitly address aspects of these differences if adjustments are to be beneficial for all concerned.

Population analysis of each of these two groups should include knowledge of the population characteristics and an understanding of the changes occurring in the population over time. This information is essential for knowing what life is like for both the local community and the source of impact community. It is also critical for anticipating what life might be like in the future for each, given the possible stresses, unfamiliar experiences, new responsibilities, and personal adjustments that may result when the two groups come together.

The framework for analysis

Analysis of community population trends requires information about the structural characteristics of a population and about the population processes, or the way a population changes over time. Both the characteristics and the processes are equally important to understanding population. Each has an effect on the other; therefore, they should be examined together. For example, if a young labor force which includes women in their childbearing years moves into a retirement community, the existing age structure of the local setting could be lowered considerably by the birth rates of the newcomers. A shift in age structure alone can have a significant effect on the need for different kinds of educational facilities, health and counseling services, and recreational programs.

STRUCTURAL CHARACTERISTICS refer to descriptive information about population size, distribution and composition. For example, a group of new community residents must be understood in terms of how many there are, where they will be locating, and such characteristics as age, sex, cultural background, family type, and so on.

The usefulness of population characteristics cannot be overemphasized. Nationally, newcomers to nonmetropolitan areas tend to be younger and better skilled than long-term residents. Retirees migrating to rural areas are better off and better educated than stationary older adults. Newcomers to nonmetropolitan areas seem to

[1] For a thorough explanation of these and other components of the Growth Impact Assessment and Management Model see Faas and Howell, 1979.

include an increasingly high proportion of well-educated, highly trained young adults. Newcomers representing higher socio-economic classes bring different expectations in areas such as lifestyle, agency and business efficiency, and capital improvements (Lichter, Heaton, and Fuguitt 1979).

POPULATION PROCESSES include fertility, mortality, and migration. They are as important to population analysis as the foregoing structural characteristics. These causes of population change are both determinants and consequences of population size, distribution, and composition. For example, a particular population grows (or declines) as a result of babies being born into it, people departing through death, people moving in, or people moving out.

The balance that results between births and deaths is the natural increase, or decrease when deaths exceed births. The balance that results from inmigration and outmigration is net migration.[2] These two elements are the forces underlying population change. Think of it this way: the population is being increased by the birth of infants, but at the same time is being decreased by the deaths of people of all ages. Concurrently, inmigrants are arriving and outmigrants are departing. These four debit/credit components (birth, deaths, inmigration, outmigration) are the basis of population size.

Table 1 lists the most important elements to consider in examining structural characteristics and population processes together.

Trying to collect and interpret data on all of the preceding characteristics and processes, particularly at one time, may be neither practical nor necessary. The section that follows will outline some of the factors to consider in determining what information will be most helpful. Because a vast amount of population data is available, there is danger of being overwhelmed by the sheer volume of statistics. In the early stages, try to limit the analysis by narrowing the problem for which you need information. Define the key questions to be answered: know the specific use for the information.

- Is it intended to demonstrate a specific need (expanded school capacity, recreation facilities for teens, improved busing for the elderly)?
- Is it intended to provide an estimate of a particular target population (elderly residents, newcomer households, women of childbearing age, the unemployed, commuters)?
- Is it intended to evaluate the impact of a change in service (a new shopping center, an ambulance service, a counseling center)?

Structural characteristics

SIZE refers to the number of people in the local setting and how fast this has been growing or declining over the years. For example, if the population has been relatively stable or in a state of decline, a rapid influx of new people may cause considerable financial and social stress.

Table 1. Important elements of structural characteristics and processes of population.

Structural characteristics	Population processes
SIZE	**FERTILITY**
Growth or decline	Birth rates
Numbers: absolute	
Numbers: relative	**MORTALITY**
	Death rates
DISTRIBUTION	
Areas within a community where residents settle	
COMPOSITION	**MIGRATION**
Age	Inmigration
Sex	Outmigration
Cultural groups	Net migration
Family types and sizes	Gross migration
	Selective movements:
Income	commuters
Education	laborers
Occupation	seasonal

[2] Inmigration and outmigration refer to migration *within* a nation. Immigration and emigration refer to migration between nations.

In analyzing the size of the population, try to distinguish between absolute population change and relative population change. Each conveys a different picture.

Absolute population change is the actual number of persons added or lost during a specified time period. Actual numbers are not as useful when comparing one community to another if they are very different in size. However, these figures are essential for analyzing the need and demand for services.

Relative population change is the percent change in population for a particular time period and can be used to compare population trends objectively between communities. Percentage change usually refers to a percentage *point* change, i.e. from 10.0% to 9.0% is a one percentage point decline. Percent changes are frequently cited in census publications and agency reports; once they have been calculated, comparisons can be easily made.

Overbuilding facilities for populations that never materialize, or failing to plan for growth and facing boomtown conditions, are both good reasons for caution in the use of population projections.

The usefulness of both absolute and relative population growth figures can be illustrated by considering a community of 1,500 people that grows to 4,500 in three years. Although the absolute population size of 4,500 does not seem large, it represents a 200 percent growth rate. A total of 3,000 newcomers descended on a community that originally was only half that large. The percent change, or growth rate for this hypothetical community is calculated as follows:

$$\frac{4{,}500 - 1{,}500}{1{,}500} \times 100 = 200\% \quad \text{(percent change)}$$

Also examine the size of the newcomer population. It may be difficult to predict exactly how many people may be involved, particularly if they are expected to arrive at different times. Varying numbers of people may come during planning, construction, and operational phases of a new development. Estimates of the newcomer population will not come from census materials. Sometimes they can be obtained from the developer, construction firm, or relevant government agency. It may also be helpful to ask another community that has experienced a similar type of impact. Estimates can only be approximate, given the variety of factors underlying people's motivation to move to a particular community. One should also be sensitive to obvious overestimates or underestimates of new-resident population that may be provided by private firms with vested interests. Overbuilding facilities for populations that never materialize, or failing to plan for growth and facing boomtown conditions, are both good reasons for caution in the use of population projections.

Knowing approximately how many people the source of impact may bring, and when they will come, can assist in planning for additions to schools, sewer and water hookups for projected housing developments, and other capital improvement items. A knowledge of how long the newcomers plan to stay will be extremely valuable in planning for permanent and temporary facilities.

DISTRIBUTION refers to the geographic location or settlement patterns of the population. A look at the county planner's map of residential sites can reveal a lot about population density. A visual study of population dispersal should provide a general sense of how housing units are clustered—for example, around a lake, down a valley, on a hill crest, or adjacent to railroad tracks. If possible, obtain a count of housing units in designated areas to determine housing density. The local housing agency may also be able to assist in identifying "density pockets," such as those areas where there are a lot of young adults, elderly, or ethnic group residents.

Consider what is known about population distribution in the local community; then apply it to what is known about the newcomer population. The following questions may be helpful:

- Where are newcomers most likely to live?
- What effects will the newcomers' residential location have on existing settlement patterns?
- How will this affect density per housing unit? For example, will a high number of people share one housing unit, or will many people live alone?

Some of these answers may be difficult to anticipate; however, the information could prove invaluable. Several hundred construction workers' families could put considerable strain on existing mobile home parks and apartment complexes. The result could be overcrowding, excessive noise, and sanitation problems—all of which create adverse physical, mental, and environmental conditions.

Problems of social integration can be anticipated and prevented by learning more about cultural groups and ethnic backgrounds of present community residents.

COMPOSITION refers to the many personal characteristics represented in the population. A thorough understanding of the individual makeup of the long-term residents is central to anticipating possible impacts of a newcomer population. Although a great many characteristics can be examined, it is best to limit the analysis at first. Age and sex are the two characteristics most frequently included. They are closely related to numbers of births and deaths, and therefore are essential to understanding population changes.

Knowing the numbers and proportions of people in certain age groups is essential for projecting the need for such things as school additions, new hospital wings, prenatal clinics, and bus services. If the present population is disproportionately elderly, a newcomer population of young families may suggest a need for teenage recreation facilities, improving the maternity ward, or a new wing on the high school. These solutions may not be practical, however, if this newcomer population is only staying for one year. If newcomers are predominantly male construction workers, this may offer income-earning opportunities for retired residents who have large houses with extra living space. The sexual imbalance created by a lot of male construction workers may also put strain on families with teenage children and on community recreation facilities.

Other characteristics to examine are cultural groups, family types and sizes, income, education, and occupation. Restrict the analysis to high-priority questions.

Problems of social integration can be anticipated and prevented by learning more about cultural groups and ethnic backgrounds of present community residents. For example, what are the absolute numbers of African-Americans, Hispanics, Native Americans, or Asians compared to Caucasians? If the composition of the newcomer group changes the usual balance, probably both groups will feel it. Plan systematic ways of easing potential disruption—for example, minority representation on advisory committees, acceptable recreational opportunities, and sources for customary food.

Are there additional political, religious, or status alliances that may be changed by newcomers who are intolerant or oblivious of such affiliations? Community solidarity may be threatened unless planners and leaders find ways to gently merge one group with the other, or to protect those cultural identities that have deep value. In the same way, understanding the predominant family types or living arrangements among both long-term residents and newcomers may help to ease potential lifestyle and value differences.

Community solidarity may be threatened unless planners and leaders find ways to gently merge one group with the other, or to protect those cultural identities that have deep value.

Look at the potential size of newcomers' families. Among some ethnic groups—the Hispanic, for example—the average number of people sharing one housing unit is frequently larger than among Caucasian families. A large number of high-density family types should prompt planners to consider housing arrangements and designs that accommodate this need and acceptable recreation facilities to relieve the pressure of crowded accommodations. On the other hand, newcomers may consist of a young adult population, many of whom are in management positions. This type of population may have few children and small households.

The income factor is significant, particularly if population changes bring wide income discrepancies. For example, a low-income community may be looking forward to a new development because new residents will bring added spending power; what the community may overlook is the newcomers' added service needs. The cost of expanding fire or police protection or sewer hook-ups is often borne equally by long term and new residents. Consider who will bear the cost if new residents live in apartments or mobile home parks; property taxes on the existing low-income population may be prohibitive.

Educational and occupational information about local residents may help anticipate new employment opportunities. A new industry may require certain skills in its labor force; however, if these skills are not available locally, an alternative labor source will be found. If jobs are needed, the community could develop appropriate training programs to prepare local residents for employment. If possible, try to anticipate educational and occupational backgrounds of new residents, too. Newcomer spouses may be accustomed to holding good jobs, or to participating in adult education classes. Why not plan ahead for these needs? It may be possible to take advantage of incoming resources to ease the newcomers' adjustment problems.

Population processes

Fertility is discussed in terms of crude birth rates and age-specific birth rates. The number of children born affects, and is affected by, many dimensions of society. This factor is reflected in labor force availability, family types, housing requirements, and social service needs. It is tied not only to biology but also to ethnic and religious background, place of residence, income level, and educational attainment. This factor, therefore, must be looked at in relation to both local and incoming population structure.

CRUDE BIRTH RATE is one way of describing births. This measure is included in most census reports. It refers to the yearly number of live births per 1,000 population. It is a general measure of births and may be biased by the sexual balance and age structure of the population. For example, it may show an artificially low measure of fertility where there is a high proportion of men in the community and a shortage of women. Similarly, it may reflect a high birth rate if the proportion of women in the population is high.

GENERAL FERTILITY RATE is also used in population reports to measure birth rates. Unlike the crude birth rate, it is sensitive to age and sex composition. It represents the number of births that occur in a year per 1,000 women of childbearing age (considered to be between 15 and 44 years).

Use a measure of births to determine if there is anything unique about birth rates in your local community. Are the number of births comparable to those of the state—and if not, why not? Perhaps residents represent high or low proportions of one age or ethnic group. In considering the newcomer population, would you expect their birth rates to be any different than those exhibited by the local community? Birth rates are extremely difficult to predict, especially now among the young adult population. Young adults appear to be postponing their children; however, experts disagree on whether or not this will continue. Regardless, a community should be able to make an informed estimate about future numbers of children to be accommodated. Schools, day care centers, clinics, medical facilities, and social services all require advance planning.

MORTALITY also contributes to population growth or decline. Today's tendency for people to live longer has obvious effects on population size, particularly if birth rates are high. The same trend may affect population composition because American women have a longer life expectancy than American men. Without looking at population structure and processes interdependently, one might mistakenly conclude that a high number of deaths implies an unhealthy community, but an area with a high concentration of elderly, such as a retirement area, will obviously have a higher death rate than other places, which emphasizes the importance of studying several pieces of population information to obtain a true picture.

A community needs to know something about deaths among specific age groups, for example among infants, or teenage mothers. It

Consider who will bear the cost if new residents live in apartments or mobile home parks; property taxes on the existing low-income population may be prohibitive.

may also be useful to look at deaths attributed to specific causes, such as traffic accidents, industrial safety hazards, or seasonal deaths associated with tourism. Past trend information will provide a useful benchmark against which to measure future changes. For example, a rapid population increase may accelerate the number of accidental deaths. Likewise, if birth rates increase and prenatal care is inadequate, there may also be more infant and maternal mortality.

The **CRUDE DEATH RATE** is one measure of deaths used in vital statistics reports. This is the total number of deaths occurring in one year per 1,000 people. As with the crude birth rate, it hides information that may be helpful in planning. Age-specific death rates would probably be more useful, for example, infant mortality. The infant mortality figure represents the number of infants dying in their first year of life for every 1,000 live births. Other age specific death rates are the number of deaths of persons of a certain age per 1,000 persons of that age in the population.

The ability of a community to prevent or respond to accidents will be reflected in accidental death rate figures.

If community data show a high rate of infant deaths or deaths in other age groups (when compared to the state figure), try to determine why this population group has not been surviving. Will continued population growth accelerate the problem? Are emergency medical care resources sufficient? Do newcomers' belief systems about health care complement or conflict with those of long term residents?

The local vital records office, hospitals, or doctors may be able to supply numbers of deaths from specific causes. This is an important area to watch as a community experiences a rapid population increase. Roads may not be designed to handle increased traffic. There may be more heavy construction equipment and fewer experienced operators. Play areas for children may not be adequately planned or supervised. There may be a shortage of trained medical personnel and emergency services. The ability of a community to prevent or respond to accidents will be reflected in accidental death rate figures.

POPULATION MOVEMENT contributes to the size of a community. A population becomes larger as it experiences an influx of migrants, and smaller when its members leave to join another population elsewhere. This inmigration and outmigration affects not only the population's size, but also its composition and distribution.

Uhlman and others (1975) provide an illustration of how population movement can affect birth and death rates. In two energy-impacted Wyoming communities, newcomers were not only much younger, but they also had larger households and more children at home than did long term residents.

Leistritz and others (1978) who studied Northern Great Plains energy development sites point out the potential difference in population composition among the migrants themselves. Operating workers have a greater tendency to be younger, married, and have larger families than construction workers. Construction workers are less likely to bring their families; they commute longer distances than operating workers.

One population movement figure that may be of interest is net migration. This is the net balance between arrivals and departures, or the prevailing balance between in- and outmigration. If departures exceed arrivals, net migration is considered to be negative. If arrivals exceed departures, then net migration is considered to be positive.

If natural increase is low, as it is in many western states today, a high growth population is the result of two things; retaining the resident population and, at the same time, attracting newcomers from outside. Outmigration must be low and inmigration high.

While important in assessing population growth, net migration estimates provide little insight into the overall numbers of people moving in or out. Net migration gains and losses are only surface indicators of a much more significant crosscurrent of movement. Net migration only describes the net result of people's moves. It really tells you nothing about the actual numbers of people being added to the community through inmigration, or the actual numbers leaving the community through outmigration. For example, a community may gain 200 people through net migration. This figure could hypothetically be the net result of the moves of 2,000 people—1,100 people moving in and 900 people moving out. If this occurred within a short period of time, this situation could put extreme pressure on a small rural community. An added 200 people might not strain available facilities and services beyond capacity, but the change in people within the community would cause other, more specific problems.

Net migration gains and losses are only surface indicators of a much more significant crosscurrent of movement.

Knowing the gross migration figure will also help a community to get a more realistic picture of in- and outmigration. This is the total or aggregate number of inmigrants and outmigrants—the sum of all arrivals and departures.

After studying the components of the local community's net migration figure, the following questions might be asked to provide further planning insight:

- Is net migration more affected by inmigration or outmigration?
- Is net population change more affected by natural increase (births and deaths) or by actual movement of people in or out?
- Is it possible that some of the long term residents will move out of the local community in response to new developments?

The timing of arrivals and departures may fluctuate in growth-related inmigration and outmigration. This may be the case when commuters are coming in for shopping or recreation, or when residents are going out for employment. A community should identify possible "pressure points" and attempt to plan ahead to ease strains. For example, if winter recreation is the attraction bringing high numbers of seasonal inmigrants, the need for extra facilities and services may exist in only one season. A community experiencing seasonal population growth may have to ask itself how these extra costs can be justified on a year-round basis—or if there is a way to take advantage of the facilities in other seasons, too.

SOURCES OF INFORMATION

In your local community or county there are probably a number of readily available sources for population information. Census and vital statistics data that have been systematically collected and compiled will be the most easily accessible source. Normally some of these publications can be found in such places as the county court house, county Extension office, public health office, public library, or county/district planning office.

Census data are collected by the U.S. Bureau of Census every 10 years, including information on most population structure characteristics and on population processes. Four volumes are published about each state, including statistics about townships, municipalities, counties, and metropolitan areas. There is a great deal of variation by state in the type of data available between censuses for counties and communities. You can find out what is available in your state by calling your State Data Center. The Census Bureau in Washington, D.C. maintains an up-to-date list of contacts for each state which may be obtained by calling (301)763-4100.

Particularly helpful for size and income estimates between censuses are two publications from Current Population Reports in their P-25 series: *Per Capita Money Income Estimates for States, Counties and Incorporated Places*, and *Estimates of the Population of Counties and Metropolitan Areas*. Both reports are issued periodically during the decade.

Census information is available in a variety of forms, including microfilm, computer tape, and compact disk. Many colleges and universities, regional and local planning commissions, libraries, and state agencies purchase these for public use. In addition to the Census of Population, there are also Censuses of Agriculture, Housing, Business and Manufacturing, Governments, and Transportation.

County and City Data Books are available from the U.S. Bureau of Census in computer and printed form. Most county planning offices have these. These combine easily manageable data from the Censuses of Population, Housing, Governments, and Manufacturing. Most of the information is aggregated by state, county, city, and standard metropolitan statistical area.

In most states there is one designated office that collects, compiles, and publishes state population information. This may be an official state agency at the state capital, a university department, or something comparable. Ask your public library or county Extension office the location of this source. Usually, annual data summaries are available at minimal or no cost.

Vital statistics data offer another excellent source of population information. Most states compile and publish these records annually. Information is usually included on births, deaths, marriages, and divorces. Several useful measures discussed in the population processes section of this publication are normally available, such as crude birth rates, crude death rates, age-specific death rates, and deaths according to specific causes. If vital statistics information is

used in conjunction with census data, this should provide an adequate tool for examining population processes and factors associated with population growth.

Usually, one state agency collects, organizes, and disseminates vital statistics information. In some states this is done through a state health department. Annual summaries of vital statistics usually can be obtained at no cost. In the community, vital statistics materials are often found at health or social service offices, community action centers, libraries, planning commissions, or court houses.

At the federal level, the National Center for Health Statistics compiles vital statistics annually by state, county, and city. They also have periodic data on health facilities such as hospitals, nursing homes, and clinics and medical personnel.

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COPING WITH CHANGE

Community leaders and government agency representatives need to understand local population trends, particularly in situations of rapid change. This publication outlines a simple framework of what to analyze in population changes, along with useful methods and criteria that can be applied when considering management and policy alternatives.

Two population communities must be considered: the long-term residents, and the newcomer group. The method suggested for population analysis poses practical questions that any community can apply in analyzing its circumstances.

Agency representatives and local leaders can use population information to make informed estimates about the social and economic effects of development. Suggestions are included for guiding citizens in responsible public decision making and policy making so that changes can be systematically managed.

Population data is readily available in most communities at minimal cost, and possible sources are listed. The focus is on priority needs so that only the most useful information is sought.